



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,162	07/21/2003	Yoshitsugu Hama	2003-1012	2719

513 7590 10/06/2005

WENDEROTH, LIND & PONACK, L.L.P.  
2033 K STREET N. W.  
SUITE 800  
WASHINGTON, DC 20006-1021

EXAMINER
----------

BEFUMO, JENNA LEIGH

ART UNIT	PAPER NUMBER
----------	--------------

1771

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/623,162

Applicant(s)

HAMA ET AL.

Examiner

Jenna-Leigh Befumo

Art Unit

1771

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-81 is/are pending in the application.
- 4a) Of the above claim(s) 14-31 and 52-81 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 32-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Group I. Claims 1 – 13 and 32 – 51 in the reply filed on July 14, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 14 – 31 and 52 – 81 are withdrawn from further consideration as being drawn to a nonelected invention.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 32 – 37 and 39 – 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morweiser et al. (5,470,485) in view of Jones (4,961,974).

Morweiser et al. discloses a filter material comprising a blend of polyolefin fibers and polyacrylonitrile (PAN) fibers (abstract). The ratio of polyolefin fibers to PAN fibers range from 30:70 to 80:20 (column 2, lines 8 – 9). The polyolefin fibers are thermally activated to bond the fibers together (column 2, lines 22 – 27). Morweiser et al. discloses that based on the end-use of the fabric pressure can be applied to the fabric while the fabric is being heated. Thus, the fabric would be thermo-compressed. Additionally, the diameter of the PAN fibers is less than 100 $\mu$ m (column 2, lines 6 – 7). A fiber with a diameter of 100 $\mu$ m has a denier of about 80. Therefore, Morweiser et al. teaches using fibers which would have a denier of less than 80.

While Morweiser et al. discloses that the filter material may be used as a filtering component of a laminate made from a plurality of elements, Morweiser et al. fails to teach combining the layer with a segregating membrane. Jones et al. is drawn to laminated filters and discloses that it is known in the art to use conventional filter layers, such as thermally bonded nonwoven fabrics, in laminated filters made of two or more layers (column 1, lines 12 – 30). Further, Jones discloses a filter layer made from a high loft layer of powder bonded nonwoven fabric bonded to a filter layer which supplies stiffness and filtration efficiency (column 2, lines 13 – 35). The powder bonded nonwoven fabric can be made from different materials such as polyamide fibers or polyacrylonitrile fibers (column 3, lines 45 – 60). Thus, it would have been obvious to one having ordinary skill in the art to combine the high loft nonwoven layer taught by Jones et al. with the filter material disclosed by Morweiser et al. since both Morweiser and Jones disclose that the individual filter layers can be combined with other filter layers to make a composite filter. Combining fabrics with different filtering characteristics allows one of skill in the art to optimize or modify the filtering properties of the fabrics to design filters for specific uses as well as preventing the filters from clogging quickly.

Morweiser et al. fails to teach the bulk density of the fabric. However, the bulk density would be determined by the pressure and heat during the compression and heat setting process and final thickness of the product. It would have been obvious to one of ordinary skill in the art to produce a compressed fabric which has bulk density of 40% to 75% of the weighted average density of the fibers to produce a fabric with decreased pore sizes that can be used to filter smaller components. Thus, claims 32 – 37 and 40 are rejected.

Although the limitations of permeability in units of  $\text{cm}^3/\text{cm}^2/\text{sec}$  are not explicitly taught by Morweiser et al, it is reasonable to presume that said limitations would be met by the combination set forth above. Support for said presumption is found in the use of similar materials (i.e. a nonwoven fabric comprising PAN fibers and binder fibers) and in the similar production steps (i.e. thermo-compressing the fabric) used to produce the filter material. The burden is upon the Applicant to prove otherwise. Thus, claim 39 is rejected.

Morweiser et al. fails to teach the thickness of the nonwoven fabric. However, it would have been obvious for one having ordinary skill in the art to choose the claimed thickness range for fabric taught by Morweiser et al. based on the end-use of the fabric. For example, filter papers and filter materials used to filter off fine particles would require very small thickness. Therefore, claim 41 is rejected.

4. Claims 1 – 10, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morweiser et al. in view of Jones and Schultink et al. (6,372,004).

5. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morweiser et al. and Jones et al. as applied to claim 32 above, and further in view of Schultink et al.

The features of Morweiser and Jones have been set forth above. Morweiser et al. fails to teach using fibers which are between 1 and 25mm in length. Schultink et al. is drawn to composite filter products. Schultink et al. discloses filter materials can be made by the processed disclosed by Morweiser et al. using fibers having a length of 5 – 20 mm. Thus, it would have been obvious to one having ordinary skill in the art to use fibers with a length of 5 – 20 mm as disclosed by Schultink et al. in the product taught by Morweiser et al. because Schultink et al.

Art Unit: 1771

teaches that filter product can be produced using shorter fiber lengths. Thus, claims 1 – 10, 12, 13, and 38 are rejected.

6. Claims 42 – 47 and 49 – 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morweiser et al. in view of Jones and Dean et al. (6,132,868).

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morweiser et al., Jones et al., and Schultink et al. as applied to claim 8 above, and further in view of Dean et al.

The features of Morweiser et al., Jones et al., and Schultink et al. have been set forth above. While Morweiser et al. discloses that low melt co-polyester can be used as the binder material, Morweiser et al. fails to teach using undrawn polyester as the binder material. Dean et al. is drawn to co-polyester binder fibers. Dean et al. discloses a co-polyester material which is useful as a binder fiber in monocomponent or bicomponent fibers when blended with other materials, such as acrylic fibers, and then heated to form bonds between the fibers (column 10, lines 30 – 57). Dean et al. also discloses that the co-polyester can be used as a binder fiber in the as-spun, or undrawn, form to produce lightweight nonwovens where low shrinkage is desirable. Thus, it would have been obvious to substitute undrawn co-polyesters, as taught by Dean et al, for the co-polyester material in the invention taught by Morweiser et al. to produce an end product with low shrinkage. Therefore, claims 11, 42 – 47, and 49 – 51 are rejected.

8. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morweiser et al, Jones et al, and Dean et al. as applied to claim 42 above, and further in view of Schultink et al.

The features of Morweiser et al., Jones et al, Dean et al., and Schultink et al., have been set forth above. Morweiser et al. fails to teach using fibers which are between 1 and 25mm in length. Schultink et al. is drawn to composite filter products. Schultink et al. discloses filter

Art Unit: 1771

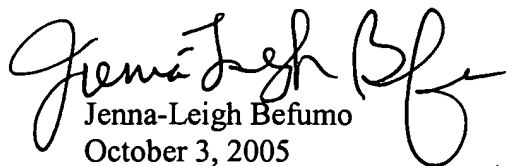
materials can be made by the processed disclosed by Morweiser et al. using fibers having a length of 5 – 20 mm. Thus, it would have been obvious to one having ordinary skill in the art to use fibers with a length of 5 – 20 mm as disclosed by Schultink et al. in the product taught by Morweiser et al. because Schultink et al. teaches that filter product can be produced using shorter fiber lengths. Thus, claim 48 is rejected.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jenna-Leigh Befumo whose telephone number is (571) 272-1472. The examiner can normally be reached on Monday - Friday (8:00 - 5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jenna-Leigh Befumo  
October 3, 2005